4 Resource Protection

Protecting natural resources – both land and water ecosystems– is a crucial element to watershed management. BWM has successfully developed and implemented three significant plans that minimize impacts to water quality. *The Land Acquisition Plan*, originally written in 1991 and revised in 1998, sets the goals for the Bureau's land purchases. *The Wachusett Reservoir Watershed Public Access Plan*, a 1996 document updated in 2003, details policies for public use of BWM property in the watershed. *The Wachusett Reservoir Land Management Plan*, published in 2001, describes how the BWM manages the natural resources on its watershed land. Wildlife control, in particular the harassment of gulls and other water-based birds, is a critical element to the Bureau's success at maintaining the water quality parameters necessary for an unfiltered drinking water supply. BWM also relies on other owners of conservation land, both public and private, to help meet its water quality goals.

4.1 Land Acquisition Program

Accomplishments:
- Acquired sensitive, high-risk lands. BWM currently owns or controls through agreement 29.1% of the Wachusett Reservoir Watershed.
- Acquired and conducted an annual monitoring program on 30 Conservation Restrictions (CR), totaling 2,003 acres.

Assessment:
BWM acquired 3,415 acres over the past five years bringing the total acreage now held both in fee and CR to 18,438 acres. The total amount of land under BWM control is 20,602 acres after the inclusion of the property held by DCR/DSPR that is under a Care and Control Agreement with the Bureau. Each land acquisition goal has been reached or is ahead of schedule, including 25% ownership target established by EPA and internal benchmarks established by the 1998 MDC Land Acquisition Plan.

Key Actions:
- Maximize long-term water quality benefit by acquiring and protecting sensitive watershed lands.
- Implement and update the GIS land acquisition model.
- Pursue negotiations for obtaining watershed parcels, as identified through the GIS model, either in fee or conservation restrictions.
- Seek to obtain additional CRs on other protected lands by including specific water supply protection language.
- Coordinate acquisitions with other public and private entities to maximize land protection in the watershed.

Background

Over the past fifteen years, BWM has conducted a watershed land acquisition program "to protect sensitive watershed land from urbanization and to restore and maintain stable forest cover on this

land." The chief value of this program is to help maintain high water quality into the future. The pollutants that are potentially associated with urbanization include: bacteria, pathogens, nutrients, sediments, heavy metals, and other contaminants associated with increased stormwater runoff.

A major tenet of watershed management is protection through ownership of interests in watershed lands. Owning and managing watershed lands surrounding a water supply source is recognized as the most direct and proven method of protecting the water source's long-term quality for many reasons, including:

- A forested watershed provides the best quality water.
- The purchase of undeveloped lands protects water sources from development, preventing vegetation removal, drainage alteration, and the increase of impervious areas that move pollutants quickly towards streams.
- The purchase of vegetated buffers provides natural "treatment" or protection to lessen water quality impacts of future development.
- The purchase of problem properties effectively halts the problem of activity or use, and ensures proper clean-up or revegetation of the site.

The modern-day Land Acquisition Program was initiated with $3 million from the 1983 Open Space Bond. The 1987 Open Space Bond established an additional $30 million account to purchase property within the Watershed System. The Watershed Protection Act authorized a $135 million bond, to spent at a rate of $8 million per year. $100 million was spent prior to the remaining $35 million being integrated into the 2002 Environmental Bond.

Current Program and Accomplishments

BWM purchases land both in fee and conservation restrictions (CRs), which are typically conveyed as "friendly," or consensual, eminent domain takings. Since 1998, 3,415 acres have been acquired by fee or CR bringing the total acreage that the BWM manages to 18,389 acres (**see Table 4-1**). At present, BWM has acquired 30 CRs, totaling 2,003 acres, and will continue to pursue CRs when feasible. Based on the 1991 and 1998 *MDC Land Acquisition Plans*, the BWM is on or ahead of schedule of protecting sensitive watershed lands with the Wachusett Reservoir watershed (**see Figure 4-1**).

Since the Land Acquisition Program began in 1985, BWM has increased the percentage of agency controlled land at the Wachusett Reservoir watershed from 7.9 to 29.1 percent, which also includes land protection agreements with other state agencies (**see Table 4-2**).

BWM developed a comprehensive computer model to guide these acquisitions in the Wachusett Reservoir watershed. This model scores the sensitivity (watershed index) of all land using twelve weighted criteria and three basin overlay multipliers. These criteria include: proximity to the reservoir, development threats that could endanger water quality, protection of rare and endangered plant species habitat, land near tributaries, wetlands and aquifers, wildlife habitats, scenic amenities and land adjacent to other BWM holdings. The watershed index, calculated by the computer model, indicates areas that are rich in water resources and sensitive to degradation. The Bureau now controls 36% of the most sensitive lands in the watershed according to this watershed index (**see Table 4-3**).

Figure 4-1: Wachusett Reservoir Watershed Protected Open Space
Go to: www.mass.gov/dcr/waterSupply/watershed/documents/2003WachWPPfig4_1.pdf

Table 4-1
BWM Land Acquisitions 1999 – 2003

Fiscal Year	Watershed			Total Acres	Total Cost (millions)
	Wachusett Reservoir	Quabbin Reservoir	Ware River		
1999	888	0	0	888	$7.8.
2000	873	0	0	873	$6.8
2001	733	0	224	957	$6.6
2002	685	107	632	1426	$7.7
2003	235	11	0	246	$2.25.
Total	**3,414**	**118**	**856**	**4,388**	**$31.15**

Source: DCR General Counsel, 2003

Table 4-2
Watershed Management Land Holdings, 1985 – 2003

Watershed	1985		1998		2003	
	Acres	% of Watershed	Acres	% of Watershed	Acres	% of Watershed
Wachusett Reservoir	5,608	7.9%	18,074[1]	25.5%	20,600[2]	29.1%
Quabbin Reservoir	51,792	54.5%	54,203	57%	54,321	57.2%
Ware River	19,300	31.3%	22,838	37.0%	23,694	38.2%
Total	**76,700**	**33.7%**	**95,115**	**41.8%**	**98,615**	**43.3%**

Source: DCR General Counsel and DWSP GIS, 2003
[1] Includes 2,213 acres owned by DCR Division of State Parks and Recreation under a Care & Control MOU and FY99 acquisitions.
[2] Includes 2,213 acres owned by DCR Division of State Parks and Recreation under a Care & Control MOU.

Table 4-3
Comparison of Protected Land and Wachusett Reservoir watershed Index of Sensitivity[1]

% of Watershed BWM Controlled[1]	% of Watershed Other Permanent Open Space	% of Watershed Chapter 61	Total % Protected Open Space	% of High Sensitive Land BWM Controlled[2]	% of High Sensitive Land Other Permanent Open Space	% of High Sensitive Land Chapter 61	Total % of High Sensitive Land Protected
29%	14%	10%	53%	36%	9%	7%	54%

Source: DWSP GIS, 2003
[1] The Watershed Index of Sensitivity is a computer generated index of areas rich in water resources and sensitive to degradation. This table demonstrates that the lands directly controlled by the BWM are the most critical to water quality protection.
[2] Includes 2,213 acres owned by DCR Division of State Parks under a Care & Control MOU.

Assessment

Significant achievements in land acquisition have been attained by the Bureau over the past ten years. Many of the near-term goals for BWM control of lands, both internal and external, have been met. Future land acquisition efforts will continue where needed to protect highly sensitive land from development.

The Environmental Bond of 2002 allocated $16 million dollars for watershed land acquisition. This amount represents a significant drop in funds compared to prior budgets over the past ten years. The Bureau must reassess its priorities based on this decrease. The associated management responsibilities of fee owned land – control of public access, policing encroachments, forest maintenance – is another factor that the Bureau realizes must be considered during the land acquisition process (**see Section 4.2.3**). Developing partnerships with non-profits, municipalities, and other agencies for the purpose of protecting land will help keep costs down, as will, when appropriate, the purchase of CRs (**see Section 4.3**).

The currently allocated land acquisition funds, and any future funding mechanisms, will continue to be distributed for purchases among the three active water supply watersheds. The Wachusett Reservoir watershed, because it is the closest reservoir to consumers that also has the largest percentage of sensitive watershed land, remains the highest priority. The second priority for land acquisitions will be the remaining stream frontage that drains directly into the Quabbin Reservoir. Third priority will be the Ware River watershed and hydrologically remote sections of the Quabbin Reservoir watershed.

The *1998 MDC/DWM Land Acquisition Plan* was intended to cover a ten year time frame. Changes in budgets and administration, however, have created new parameters that were not factored into that plan's goals. The Land Acquisition Plan should be re-assessed to determine if the current priorities best reflect the next five years' potential funding and an even longer term perspective.

There were several buildings amongst the many land purchases made by the Bureau over the past five years. These structures require remediation and/or removal. The Bureau needs to continue its efforts to environmentally restore all of its newly acquired properties.

Control Approach

Goal

- To provide long-term water quality protection through the acquisition of rights to sensitive watershed lands, allowing the establishment of stable forest cover and reduction of potential development.

Objectives

- Meet the land ownership goals established by the Bureau's Land Acquisition Plan.
- Continue to acquire, by fee or Conservation Restriction, highly sensitive watershed land.

- Optimize land acquisition funds through cooperative agreements with state and federal agencies, local communities, and non-profit organizations.
- Increase the purchases of Conservation Restrictions.

Action Items

- Evaluate 1998 Land Acquisition Plan and assess whether it needs modification.
- Acquire control, through both in-fee acquisition and Conservation Restrictions, of highly rated land based on computer modeling and staff expertise.
- Work with EOEA and the Commonwealth Office of Development to partner with other conservation oriented entities to protect land in the Wachusett Reservoir watershed.
- Complete demolition, remediation and restoration of all property requiring such work.

4.2 Control of BWM lands

4.2.1 Public Access

Accomplishments:
- Updated the Wachusett Reservoir Watershed Public Access Plan.
- Continued Ranger program to patrol watershed, educate visitors and schools, and intervene when there are public access regulation violations.
- Coordinated with State, Environmental and Local Police to enforce BWM public access regulations.
- Installed easy-to-read signs throughout watershed.
- Developed material to aid public knowledge of rules for distribution through Rangers, at kiosks, and on the Bureau's web page.
- Created pilot hunting and bicycling programs, which were made permanent in 2003.

Assessment:
BWM has an established effective and comprehensive program of control over recreational and unauthorized use of its facilities. This program is based on no-access protective zones around water supply intakes, the presence of an active ranger force, and the control of permitted activities. This restrictive public access policy is aimed at preventing the introduction of microbiological pathogens and monitoring security.

Key Actions:
- Continue full implementation of the Wachusett Public Access Plan.
- Continue with the Ranger program to improve voluntary compliance with the public access regulations through public education.
- Continue enforcement of public access regulations through partnership with the State Police, Environmental Police and local police departments.
- Improve key public access entry points in the watershed with signs, interpretive kiosks, appropriate parking facilities and gates.
- Ensure the security of the drinking water supply.

Background

Public access, in the Bureau's management context, is a wide-ranging concept. It includes:

- The physical ability to enter and use land for recreational activities.
- The legal restrictions or prohibitions related to access or specific land or water-based recreational activities.
- Sign placement.
- Mapping.
- User education.
- Intergovernmental coordination.
- Public safety.
- Protection of public and private property rights.

BWM controls access to its lands and waters through state regulations, 350 CMR 11.00, which provide general conditions for water supply protection. This law gives the BWM sole jurisdiction over its lands and the authority to close parts of the watershed system to public access, when deemed necessary, to protect land and water resources from degradation.

The potential for impacts to the drinking water supply and other environmental resources were carefully weighed before considering any uses on BWM properties. In general, any human use will cause some level of impact. BWM determines what uses may be allowed in which areas in order to limit potential water quality impacts to acceptable levels. Because the Bureau purchases and maintains its lands for water supply protection, it must err on the side of caution in identifying uses that compromise water supply protection. BWM considers:

- Type and intensity of proposed public access use.
- The physical features of the area being considered for public activities.
- The potential for impacts to water quality from the entire spectrum of visitors.
- The resource needs to properly manage any particular use on its properties, always mindful of the primary mission of the Bureau – water supply protection.

The criteria to determine whether an activity is compatible with the Bureau's water supply mission identifies whether the activity has the potential to degrade the quality of water in the watershed or to degrade any natural resource within the watershed. BWM considers the following information in making such a determination:

- Bureau of Watershed Management goals, and guiding legislation and regulations.
- Environmental impacts to water quality and land resources.
- Potential for impacts to watershed resources and waterworks infrastructure.
- Potential impacts to staffing and other resources.
- The safety of users, abutters, staff, and general public safety.

The 1996 *Wachusett Watershed MDC Public Access Plan* (the 1996 Plan) was the first written Public Access Plan for the Wachusett Reservoir watershed. The goal of this plan was to reduce the existing level of threats to water quality from public use of BWM watershed lands and to provide management programs that afford long term protection of Wachusett Reservoir.
While BWM realizes that most of the visiting public complies with its rules and regulations, it was determined that new policies were needed to provide greater control over the minority of users who disregard or abuse the privilege of access to BWM lands. In addition, it was clear that some allowed activities needed to be limited or curtailed.

Management recommendations in the 1996 Plan focused on surveillance, education, and enforcement to impose greater control over unauthorized activities. The *Wachusett Reservoir Watershed Public Access Plan Update* was produced in 2003 in order to identify changes in existing conditions, identify and evaluate the policies that have been implemented, and assess additional needs to meet the mandate of water quality and resource protection.

Current Program and Accomplishments

Implementation of the recommendations in the 1996 Plan has resulted in better protection from impacts of public access. Identifying distinct Management Zones provided a successful structure for managing public access. In particular, establishing the Intake Protection Zone restricted immediate access to the most critical areas of the water system. Other measures promoted by the 1996 Plan that were successfully implemented include:

- Creating the uniformed Watershed Ranger program into an effective and consistent official presence to visitors. The Watershed Rangers ensure that BWM regulations are followed, and they have also evolved into an important element for handling emerging security concerns.
- Significantly improving communication and cooperation with state and local police, resulting in better prevention and protection.
- Installing portable toilets at three locations.
- Placing improved signs at key points on BWM properties throughout the watershed.
- Increasing education and outreach efforts.

Watershed Rangers

Implementation of the Public Access Plan integrates numerous staff resources to achieve the objectives of the plan. The Wachusett Watershed Rangers continued to proactively patrol the Wachusett Reservoir watershed area to educate the public about BWM rules. The Rangers teach the public to practice good stewardship habits and comply with existing rules and regulations. An average of 15,000 visitor contacts are logged every year (**see Table 4-4**).

The Watershed Rangers deal with violations of BWM Rules and Regulations according to the severity of the infraction. Minor violations usually result in the Rangers' attempts at immediate education about the water supply and by explaining BWM's rules to the violator. If the person is a repeat violator, or for serious infractions, the Massachusetts State Police (MSP) are involved. Oftentimes, violations lead to follow-up activity. In the case of horse, ATV, and similar violations, Rangers may investigate to find where the party enters the BWM land and visit the owners to discuss the rules and water supply protection.

Rangers, as well as all Bureau staff, monitor the watershed as part of normal operations and report potentially damaging activities, erosion control concerns, and illegal dumping to the BWM Environmental Quality staff for investigation and any necessary remedial action (**see Section 5.3**).

The State and Environmental Police are involved with the Rangers at those times when more extensive efforts are necessary to limit the illegal use of certain properties. The MSP based at the Holden barracks, the primary law enforcement agency in the watershed, have taken a very proactive

role in protecting the watershed and its drinking water supply. In addition to their regular 24 hour patrolling, the MSP have coordinated and undertaken a concerted effort to curtail illegal ATV operations on state and railroad property. The MSP vigorously pursue criminal violations of BWM rules and regulations.

The events of September 11, 2001 have heightened concerns regarding security and the need to protect public works from possible terrorist action. The Watershed Rangers played a lead role in closing the North and South Dikes as well as the Dam to the public immediately after September 11. Since that time, the Rangers have focused their attention on security around the main reservoir basin, utilizing foot, motor vehicle and boat patrols (**see Section 7.3** for more details on security issues).

Table 4-4
Wachusett Watershed Rangers
Average Visitor Contacts and Prohibited Activity Notices
1999-2002

Type of Contact	1999	2000	2001	2002
Visitor Contacts	13768	17455	14669	14457
Activity or Violation				
Maintenance	347	219	79	27
Dogs	213	208	139	128
Fishing	113	161	140	25
Trespass (P)	117	66	81	184[1]
Trespass (S)	86	30	49	19
Swimming (P)	150	48	78	71
Swimming (S)	89	24	47	33
Alcohol	22	13	6	0
Snowmobiles	6	5	18	1
Bikes	144	92	66	48
Wading	150	95	124	120
Horses	9	4	1	2
Sliding	112	26	5	0
Gates	N/A	37	20	14
Other	25	22	11	4

Source: DCR Watershed Rangers, 1999 - 2002
Key:
Maintenance includes re-erecting signs, posts, markers and removing debris.
Trespass (P) involves trespass in the Primary Protection Zone.
Trespass (S) involves trespass outside the primary zone or illegal night access.
Swimming (P) involves swimming in Class A waters.
Swimming (S) involves swimming in other waters.
Sliding includes illegal snow sliding or sliding on the grass hill beside the Dam.
Other includes commercial signs, bird feeding, walking on ice, fires, and use of metal detectors.
[1] Increase due to heightened security following September 11, 2001.

Public Access Policies

The policy recommendations made in the 2003 *Wachusett Reservoir Watershed Public Access Plan Update* did not significantly alter the restrictions or allowed uses initially defined in the 1996 Plan (**see Table 4-5**). The delineation of management zones remains a useful tool to define and describe allowed uses (**see Figure 4-2**). The Access Plan Update expanded the Intake Protection Zone to include the former Off-Watershed Zone so that it now encompasses the entire area around Wachusett Dam and Cosgrove Intake (**see Figure 4-3**). **Table 4-6** is a summary of all public access policies by management zone.

Table 4-5
Changes In BWM Public Access Policy
in the Wachusett Reservoir Watershed 1996 vs. 2003

ACTIVITY	1996 POLICY	2003 Policy
Shoreline Fishing	Allowed seasonally in the Reservoir & Tributary Shoreline Zone; year round fishing allowed in Tributary Headwaters (with waders) and Off-Watershed Zones.	Integrate Off-Watershed Zone into Intake Protection Zone; no fishing allowed in Intake Protection Zone.
Hiking	Allowed in all areas except the Intake Protection Zone.	Expand to allow access to lands east of Gates 1 and 2 (Management Area A2)[1].
Cross-Country Skiing	Allowed in all areas except the Intake Protection Zone.	Expand to Allow access to lands east of Gates 1 and 2 (Management Area A2)[1].
Boating	Non-motorized boats allowed on Quinapoxet and Stillwater Rivers in the Tributary Headwaters Zone; non-motorized boats allowed on West Waushacum Pond.	No Change
Swimming	PROHIBITED	No Change
Bicycling	Pilot program allowed off-road bicycles, with MDC permit, in two areas within the Tributary Headwaters Zone.	No permit requirement for off-road biking in designated area; clarify policy to allow biking from Gate 39 to 42 (formerly Off-Watershed Zone).
Horseback Riding	PROHIBITED	No Change
Camping	PROHIBITED	No Change
Motorized Vehicles (ATVs, ORVs, Snowmobiles)	PROHIBITED	No Change
Hunting	Pilot program allowed hunting, with MDC permit, in specified areas within the Tributary Headwaters Zone.	Hunting allowed with BWM permit. Hunting area is entire Tributary Headwaters Zone (locations must still meet DWFELE regulations).
Dog Walking	Allowed below Wachusett Dam with leash or while hunting in Tributary Headwaters Zone.	No Change[2]

Source: Wachusett Reservoir Watershed Public Access Plan Update, 2003.
[1] See Figure 4-3 for location of Gates and Management Areas.
[2] All access below the Wachusett Dam is temporarily restricted until completion of construction activities.

Figure 4-2: Wachusett Reservoir Watershed Public Access Management Zones
Go to: www.mass.gov/dcr/waterSupply/watershed/documents/2003WachWPPfig4_2.pdf

Assessment

BWM has an established comprehensive and effective program of control over recreational and unauthorized use of its facilities. This program is based on no-access protective zones around water supply intakes, the presence of an active ranger force, and the control of permitted activities. This restrictive public access policy is specifically aimed at preventing the introduction of microbiological pathogens and for security reasons.

The areas of general concern identified in the 2003 Public Access Plan Update include:

- **Structural and Access Controls:** Gates and other barriers need to be continually assessed. Parking problems continue along roads, especially at popular gates and sites.
- **Signs:** There are some areas where signs, despite BWM improvements, are still confusing or other indirect communication problems persist.
- **Maps:** Improved maps would better guide public access to the designated areas of the watershed.
- **Enforcement:** Dog walking, horseback riding, ATV use and snowmobiling continues to occur on BWM lands, despite extensive education and surveillance efforts of Watershed Rangers.
- **Sanitation:** The location of portable toilets needs to be re-evaluated, different/additional sites considered, and the feasibility of constructing more permanent facilities evaluated. Trash dumping remains problematic.
- **Encroachments:** The increase in BWM property has made monitoring for encroachments by abutters an on-going need (this concern is also addressed in the *Wachusett Reservoir Watershed Land Management Plan: 2001-2010*; **see Section 4.2.3**).

The 2003 Public Access Plan has a detailed implementation strategy to address these issues.

Control Approach

Goals

- To minimize the threat to water quality from public use of BWM watershed lands.
- To gain community understanding and support for the BWM's public access policies.
- To attain compliance with and enforce BWM Public Access regulations.
- To assess, and revise if needed, current access policies.

Objectives

- Protect watershed resources from public access impacts.
- Assure that public access is safe and appropriate to BWM's water quality goals.
- Inform the public on access restrictions.
- Ensure, as necessary, the security of the drinking water supply.
- Evaluate public access impacts as needed.

Action Items

- Continue Watershed Ranger program to improve voluntary compliance with the public access regulations through public education.
- Continue enforcement of public access regulations through partnership with the State Police, Environmental Police and local police departments.
- Improve key public access entry points in the watershed with signs, interpretive kiosks, appropriate parking facilities and gates.
- Develop and distribute Public Access Map(s) that show locations for hiking, bicycling, hunting, fishing, and parking.
- Provide public education and interpretive services through direct contact and printed materials.
- Foster partnerships with local entities to develop and maintain facilities on BWM land in keeping with BWM policies and regulations.
- Maintain a regular monitoring program for BWM forest roads, access points and reservoir shorelines.
- Implement Access Plan recommendations.
- Provide a yearly review of the Wachusett Reservoir Watershed Access Plan and, if necessary, a public meeting to gather input on implementation of the plan.
- Update the Wachusett Reservoir Watershed Access Plan in 2008.

Table 4-6
BWM Public Access Policy Summary
Wachusett Reservoir Watershed

ACTIVITY	Intake Protection Zone					Reservoir & Tributary Shorelines; West Waushacum Pond Zone	Tributary Headwaters Zone
	A1	A2	B1*	B2*	C		
VEHICLE ACCESS							
Off Road Driving (ORVs, ATVs)	⊘	⊘	⊘	⊘	⊘	⊘	⊘
Snowmobiling	⊘	⊘	⊘	⊘	⊘	⊘	⊘
Bicycling	⊘	⊘	⊘	⊘	⊘	⊘	✓
FOOT ACCESS							
Walking/Hiking	⊘	✓	✓	✓	✓	✓	✓
Dog Walking	⊘	⊘	⊘	✓	⊘	⊘	⊘ [1]
Cross-Country Skiing	⊘	✓	⊘	✓	✓	✓	✓
Shoreline Fishing	⊘	⊘	⊘	⊘	⊘	✓	✓
Fishing with Waders	⊘	⊘	⊘	⊘	⊘	⊘	✓
Horseback Riding	⊘	⊘	⊘	⊘	⊘	⊘	⊘
Hunting	⊘	⊘	⊘	⊘	⊘	⊘	✓ [2]
WATER ACCESS							
Boating – non-motorized	⊘	⊘	⊘	⊘	⊘	✓ [3]	✓
Boating – motorized (including "jet skis")	⊘	⊘	⊘	⊘	⊘	⊘	⊘
Swimming	⊘	⊘	⊘	⊘	⊘	⊘	⊘
Ice Skating/Ice Fishing	⊘	⊘	⊘	⊘	⊘	⊘	⊘
OTHER ACTIVITIES							
Camping	⊘	⊘	⊘	⊘	⊘	⊘	⊘
Picnicking	⊘	⊘	⊘	⊘	⊘	✓	✓
Fires & Cooking	⊘	⊘	⊘	⊘	⊘	⊘	⊘
Programs/Assemblies	⊘	⊘	⊘	⊘	⊘	✓ [2]	⊘
Trail Clearing/Trail Marking/Advertising	⊘	⊘	⊘	⊘	⊘	⊘	⊘
Collecting/Metal Detecting	⊘	⊘	⊘	⊘	⊘	⊘	⊘

✓ – Public access is allowed in designated areas only ⊘ – Activity prohibited

* All access to this area is currently prohibited for security reasons. BWM will re-open this area for the allowed uses when conditions permit.

[1] Dogs allowed with hunting permit [2] BWM Special Permit required [3] Canoes/Kayaks allowed only at West Waushacum Pond

Public access is allowed in designated areas only. Any activity which injures or defaces the property of the Commonwealth is strictly prohibited. All alcoholic beverages are prohibited. Night access is prohibited on BWM land in the Wachusett Reservoir watershed. See 350 CMR 11.09(2) for complete list of regulations. For additional information, contact the Wachusett/Sudbury Watershed Ranger Station at (978) 365-3800 or go to www.state.ma.us/mdc/pacc.htm. In an emergency, contact the Watershed Rangers or the Massachusetts State Police at (508) 829-8410.

Figure 4-3: Wachusett Reservoir Intake Protection Zone
Go to: www.mass.gov/dcr/waterSupply/watershed/documents/2003WachWPPfig4_3.pdf

4.2.2 Wildlife Control

Accomplishments:
- Continued to implement the Bird Harassment Program which maintains the reduced fecal coliform bacteria counts at the intake.
- Managed the Aquatic Wildlife Pathogen Control Zone, in which animals of concern (beaver and muskrat) are surveyed and removed from this critical area.
- Implemented habitat modifications to reduce nesting and visiting geese and to discourage beaver habitation.

Assessment:
The Bird Harassment Program and other wildlife controls are key pieces to the Bureau's success at maintaining low fecal coliform bacteria counts in the Wachusett Reservoir. The period from February 1999 to December 2003 has been the longest stretch of time since the promulgation of the Surface Water Treatment Rule in 1989 that there have been no exceedances of the SWTR's Fecal Coliform Bacteria criteria at Wachusett Reservoir (**see Figure 2-5**). The impact of birds on the intake water quality continues to be significantly diminished due to the harassment program and related efforts. Aquatic mammals are a potential concern, but are being controlled in critical areas; there is no evidence of pathogen contamination from these animals reaching the intake.

Key Actions:
- Continue successful Bird Harassment Program, including ongoing research on all available and appropriate methods.
- Implement additional habitat modifications where appropriate.
- Continue beaver and muskrat controls in the Aquatic Wildlife Pathogen Control Zone and initiate control in rest of reservoir; annually evaluate the effectiveness of these controls.

Background

Gulls, geese, ducks, and cormorants have historically roosted in large numbers at the northern part of the Wachusett Reservoir near the Cosgrove Intake from early fall until ice covers the reservoir and again in spring after ice-out. These birds like this particular area because other water bodies in the area freeze first and they feel safe in the wide open water. DWM began an intensive gull and goose harassment program at Wachusett Reservoir during 1992 to try to reduce reservoir fecal coliform bacteria levels attributed to the large roosting bird population. The basic premise of the Bird Harassment Program is to move the birds away from the intake area to distant parts of the reservoir or to other water bodies entirely.

Over the first few years of the program, DWM experimented with a variety of harassment equipment. DWM formed a Bird Harassment Committee, obtaining involvement of the state ornithologist, USDA personnel, and consultants. The Bird Harassment Committee was helpful in identifying new possibilities, particularly in approaching nesting populations and the need for some exterminations. DWM also addressed implementation needs, including designating and training staff and determining the times when the harassment efforts were needed. DWM monitored water quality and took bird counts daily during this period, and gathered data on when gulls arrived at the reservoir (season and time of day), and the direction they came.

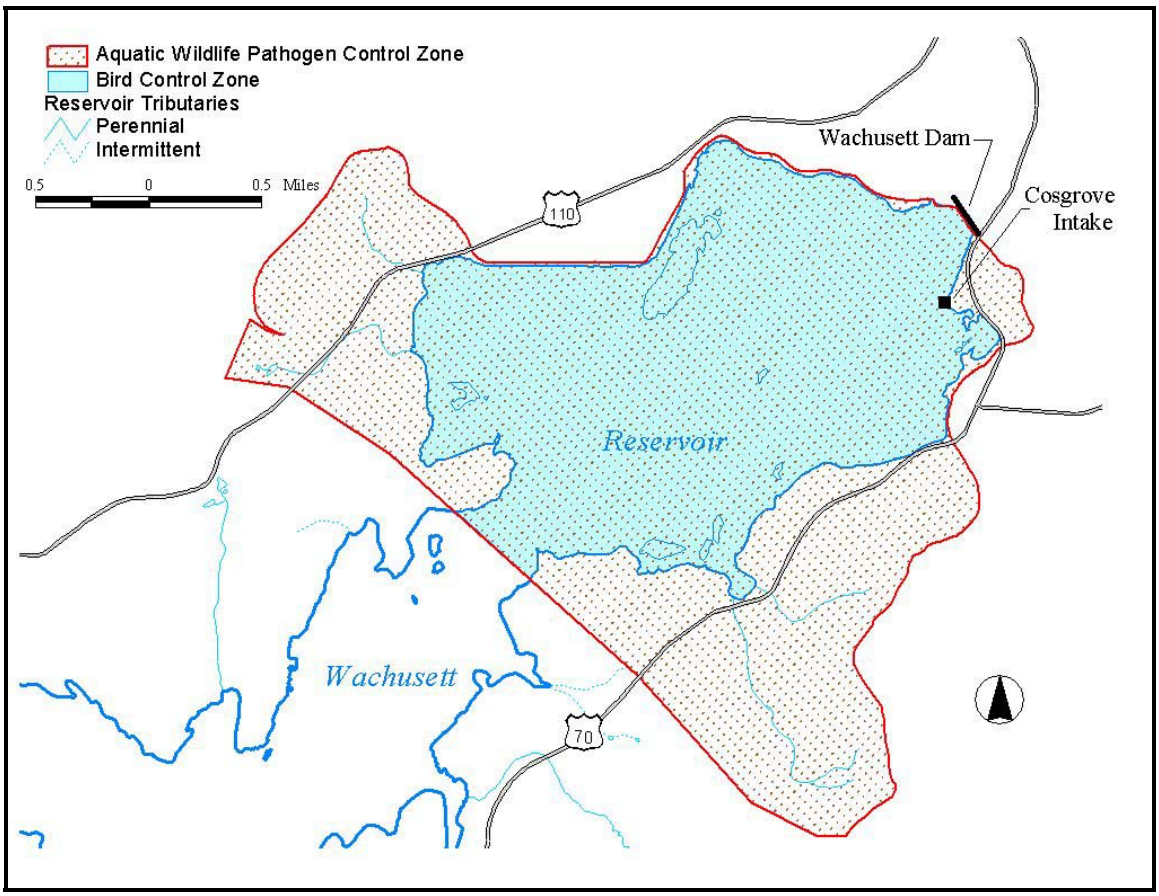
Wildlife programs and projects focused on species other than birds have grown tremendously since the 1995 stationing of a professional wildlife biologist in the Wachusett Reservoir watershed. Key wildlife populations, such as muskrat and beaver, are managed to mitigate adverse impacts on water quality, infrastructure and other watershed resources.

Current Program and Accomplishments

BWM defined the Bird Control Zone (**see Figure 4-4**), consisting of the reservoir area north of the narrows (a constricted area at the approximate east-west midpoint of the reservoir). Data confirm that by moving gulls out of the north end (either to leave the reservoir or relocate at an alternative roost area approximately 4.5 miles from the intake), fecal coliform bacteria levels drop to normal minimal levels.

The Bird Harassment Program utilizes daily human presence in boats and on shore using a variety of pyrotechnics (e.g., 12-gauge and .22 caliber shell crackers and screamers). During the winter months the Wachusett Reservoir is monitored by two observers from 3 P.M. until dark on five to seven days per week and by a single observer periodically during the day on Monday through Friday. Harassment from shore or from a boat is used as needed to move birds away from the north end of the reservoir.

Figure 4-4: Bird and Wildlife Pathogen Control Zones



A variety of techniques have been used to aid in harassment, including propane canons, "scary eyes," netting of rocks, destruction of eggs, and gull distress calls (**see Figure 4-5**). A laser rifle was tested in 2003 to help supplement shoreline harassment activities, but had only limited success. Simple pyrotechnics remain the most effective tool for moving birds away from the north end of the reservoir.

Land management practices were modified to help discourage geese from feeding on the North Dike near the reservoir. A conversion of mowed fields to uncut grassland and tree plantations took place and the numbers of geese on the shore of the reservoir dropped significantly.

The program includes a nightly count of birds landing at the north end of the reservoir and those bypassing the area, a weekly comprehensive bird count at the roost area to the south, a minimum of two available boats, hovercrafts during icing conditions, and lethal methods to reinforce non-lethal tactics. BWM maintains daily logs of activity, and prepares bi-weekly and annual reports of the program documenting its effectiveness. The program remains flexible and can be modified rapidly to add observers, harassment activities, and time periods monitored when necessary.

The Bureau initiated a few additions to advance the Bird Harassment Program. A permanent boat dock facility was constructed in 1999 by the Bureau's Civil Engineers in the Carville Basin near Cosgrove Intake. This new facility improved both personnel safety and the ability for staff to easily launch boats throughout the year. The Bureau originally purchased two small Hovercraft to reach birds in the water with partial ice cover. Their effectiveness, however, was limited in severe weather conditions due to their size. A larger Hovercraft was purchased in 1999, allowing staff to be on the Reservoir in difficult weather and for longer periods of time, thus improving the program's consistency and effectiveness.

The Aquatic Wildlife Pathogen Control Zone (**see Figure 4-4**) was established in 1999, providing a framework for the Bureau to control beaver and muskrat year-round. Beaver can dramatically alter habitats, which in turn can affect other wildlife species and humans. In addition, beaver can cause localized damage to roads, culverts, and trees, although the wetland habitat they create is seen as beneficial to a variety of wildlife species. Beaver have been linked to water-borne pathogens and are potential carriers of both *Giardia* and *Cryptosporidium* (MDC, 1999c). Whether any one colony is seen as beneficial or detrimental depends on the resources affected. The Bureau has also identified muskrat as key species in its pathogen prevention program due to their ability to potentially cause damage to watershed infrastructure (i.e., dikes and dams).

Beaver lodge.

Bureau policy regarding beaver problems takes into account the variety of situations that may arise and applies solutions as needed to offer the best long-term remediation. In situations where muskrat are causing damage to infrastructure, appropriate measures are used to mitigate the damage, including lethal removal of the individuals followed by habitat manipulation to discourage reoccupation. A detailed description of these control program can be found in the 1999 *Quabbin and Wachusett Reservoirs Watersheds Aquatic Wildlife Pathogen Control Zones* and the *Wachusett Reservoir Land Management Plan: 2001 – 2010.*

Assessment

BWM's Bird Harassment Program has been extremely effective and has directly reduced coliform levels at the intake. Fecal coliform bacteria samples are collected four to seven times per week at the Cosgrove Intake to monitor the effectiveness of the program; samples rarely contain more than ten fecal coliform bacteria colony forming units per 100 mL (cfu/100 mL) and often contain no bacteria at all. The Wachusett Reservoir intake fecal coliform bacteria levels have been in compliance with the SWTR criterion for a filtration waiver since the program's initiation in 1993, except for one reporting period in 1999 (**see Figure 2-4**). This one period of exceedance was caused by a lack of appropriate foul-weather equipment, which was subsequently purchased and integrated into the program.

Years of harassment appear to have finally modified bird behavior. Although gull numbers on or near the reservoir are generally as high as or higher than previous years, the number of birds actually settling at the north end is now very low and harassment from shore sufficient to move them towards the preferred south roost or off-reservoir. In 2002 the maximum number of gulls observed on the north end shallows was less than fifty through the month of November, and boat-based harassment was not needed until November 25th, more than two months later than in previous years. A total of 500 to 1,300 gulls were observed passing over the north end each night, but none were allowed to remain. The number of gulls utilizing the south roost during the past five years ranged from 1,000 to 6,000. Numbers remain significant, but are lower than historical highs, presumably due to a reduction in local landfills.

Figure 4-5: Fixed Deterrents Used in the Bird Control Program

Fixed deterrents used in the Bird Control Program. Netting, at left, discourages perching. The floating (middle) and land based (right) installations scare birds with motion and prerecorded distress calls. (MDC, 2002d)

Beaver populations within the Wachusett Reservoir watershed continue to expand, as beaver mortality rates remain low. As beaver continue to colonize riparian areas, it is important to recognize their role in hydrologic and ecological processes. There is some evidence to suggest that beaver ponds, like most wetlands, have a filtering effect that improves water quality by decreasing erosion and trapping sediments, particulates, and nutrients.

The Pathogen Protection Zone demarcates where beaver and muskrat will be eliminated and excluded on a continual basis for water quality protection in the Wachusett Reservoir. Situations outside the protection zone in which water quality is being threatened will be handled on a case-by-

case basis. In some instances, colonies located on DCR property may not affect DCR's structures or resources but impact adjacent private property. It is necessary to evaluate these situations on a case-by-case basis to determine DCR's level of involvement in mitigating damage occurring on non-DCR property.

Reduction of bird numbers within the Bird Control Zone at the north end of the reservoir should be sufficient to reduce impacts from fecal coliform bacteria at the intake. Control of beavers and muskrat within the Pathogen Control Zone will also protect water quality and infrastructure. Observation, harassment, and removal activities should be utilized year round and modified as necessary to provide adequate protection for the metropolitan Boston drinking water supply.

Control Approach

Goals

- To prevent elevated fecal coliform bacteria and other pathogen levels at the Cosgrove intake through appropriate wildlife controls.

Objectives

- Prevent birds from utilizing the north end of the reservoir as a roosting area.
- Continue to monitor and document bird activity to help understand behavior.
- Continue to use appropriate land management practices to discourage geese feeding on the North Dike and other critical areas.
- Continue to control resident Canada goose populations to restrict population growth.
- Continue to remove beaver and muskrat from the Control Zone and discourage their occupation.

Action Items

- Continue Bird Harassment Program using all available and appropriate methods.
- Continue to implement habitat modifications where appropriate.
- Continue beaver and muskrat control in the Aquatic Wildlife Pathogen Control Zone and, when feasible, initiate control in rest of reservoir; routinely evaluate the effectiveness of these controls.
- Monitor wildlife populations for presence of protozoa.
- Respond to complaints on beaver and beaver impoundments on DCR property impacting private land; provide assistance as time allows.
- Continue to locate all geese nesting on the reservoir and treat eggs to prevent hatching.

4.2.3 Land Management

Accomplishments:

- Professional forest staff planned and managed forests to improve long-term water quality protection.
- Conducted active silviculture on Quabbin, Ware, and Wachusett Reservoir watersheds, effectively maintaining healthy and diverse forests.
- Followed stricter BMPs than the Massachusetts Forest Cutting Practices Act in BWM's silviculture practices.
- Completed the 10 year Wachusett Land Management Plan in 2001.
- Successfully completed audit "Green Certification" for BWM forests by the Scientific Certification Systems, a Forest Stewardship Council accredited company specializing in reviewing forest management practices.
- Performed an intensive survey in 1999 to identify all non-forested habitats on BWM land at Wachusett.

Assessment:

The majority of the Wachusett Reservoir watershed forest is over 70 years old. It originates from plantation establishment during the first half of the century and from natural regrowth. The 16,384 acres of BWM-owned forests and fields provide a significant level of long-term water quality protection to Wachusett Reservoir. The successful Land Acquisition program has provided BWM with many new parcels, all of which require assessment, analysis, and management. While the vast majority of BWM-owned land is forested, a small percentage will be maintained in an open state. This management decision recognizes the value of fields, lawn and shoreline areas.

Key Actions:

- Continue to conduct silviculture activities on BWM land with the goal of forest diversity. Continue inspections to ensure compliance with BWM BMP requirements for water quality protection.
- Continue to follow the objectives outlined in the Wachusett 10-year Land Management Plan, including approaches for newly acquired lands, management of fields and shoreline, and forestry.

Background

Professional forestry staff have been working since 1979 on BWM lands in the Wachusett Reservoir watershed. Two foresters were specifically assigned in 1988 to the watershed. BWM's forest land in the Wachusett Reservoir watershed has been managed primarily by creating small openings in the forest to stimulate growth and diversify the species and age classes for maintaining a healthy and vigorous forest for watershed protection. Wachusett foresters not only adhere to the state's BMPs specified by the Massachusetts Forest Cutting Practices Act, but also incorporate stricter Conservation Management Practices (CMP) guidelines to eliminate water quality threats associated with silviculture. Careful monitoring is undertaken and, to date, no water quality degradation has been associated with BWM silvicultural practices.

Current Program and Accomplishments

The ten year Wachusett Land Management Plan was completed in 2001. The plan addresses a variety of topics including land acquisition and protection, forestry, wildlife, cultural resources, biodiversity and open space management. A major component of these topics is the maintenance of a forest cover on the majority of BWM's watershed holdings, in order to maximize the natural filtering capability of these lands.

Land Protection

A major tenet of watershed management is protection through ownership and control of watershed lands. Owning and managing undeveloped lands (particularly forested land) surrounding a water supply source is recognized as the most direct and proven method of protecting the source's long-term quality.

Payments In-Lieu of Taxes (PILOT)

After land is acquired for watershed protection, the BWM is required by MGL c. 59, s.5G to make Payments In-Lieu of Taxes (PILOT) on these properties. This law took effect for Wachusett Reservoir watershed lands in 1987. The PILOT amount is calculated by multiplying the local commercial tax rate by the land valuation as determined by the Department of Revenue (DOR). While the program is administered by the BWM, the PILOT funds come from the MWRA. The DOR is required to value the land at its "highest and best" use; this means that property that is under Article 97 open space protection is still valued as developable parcels. A key provision of this statute is that the PILOT amount can never be less than the previous year's amount, even if the tax rate or valuation diminishes. In FY2003, a total of $4,965,870 was distributed to 31 communities that have water supply property. Approximately $2 million, or 40% of this total, went to seven municipalities in the Wachusett Reservoir watershed (**see Table 4-7**).

Revaluation of state property occurs, by law, only once every five years. Unfortunately for the communities, this means that any property acquired within this cycle will not be included in determining PILOT amounts. However, BWM does pay the remainder of the existing year's taxes at the time of acquisition, and if the sale occurs in the second half of the fiscal year, it is obligated to pay the following year's taxes as well. Furthermore, if a property is being purchased out of Chapter 61 or 61A (the Forestland Taxation program), the agency is required to pay "rollback" taxes to the town, rebating the previous four years' tax abatements.

The PILOT program provides a significant benefit to the watershed system communities. They receive the same revenue from permanently protected open space that they would have received from developed land, without the associated municipal costs of police, school and fire services. BWM will continue to implement the PILOT statute, work with the MWRA to ensure proper payments, and assist the DOR in its revaluation efforts.

Table 4-7
Wachusett Reservoir Watershed Payments in Lieu of Taxes (PILOT)

Community	Property Valuation FY 2000	PILOT FY2000	2000 DOR Property Revaluation	PILOT 2001	% PILOT Increase	PILOT FY2003	% Total FY2003 PILOT
Boylston	$16,104,737	$302,903	$23,690,400	$471,439	56%	$500,000	10%
Clinton	$3,174,235	$107,765	$3,950,100	$124,349	15%	$124,902	3%
Holden	$12,562,313	$229,639	$22,334,100	$372,979	62%	$372,979	8%
Leominster	N/A	N/A	$466,900	$7,148	N/A	$7,148	.1%
Princeton	$1,912,312	$31,438	$9,127,300	$149,414	375%	$149,414	3%
Sterling	$8,599,452	$138,623	$18,164,800	$260,302	88%	$260,302	5%
West Boylston	$14,104,101	$253,874	$29,566,800	$569,752	124%	$569,752	11%
TOTAL	$56,457,150	$1,064,243	$107,300,400	$1,955,384	84%	$1,984,498	40%

Source: DCR/DWSP/BWM Planning, 2003

Land Disposition

The Bureau of Watershed Management must contend with ongoing pressure from both private and municipal parties for disposition of lands for purposes inconsistent with water supply protection. While some BWM parcels may not be deemed of critical importance to water supply protection, these areas require careful and consistent scrutiny prior to disposition. The BWM will consider land disposition only under exceptional circumstances.

The BWM Land Disposition Policy provides a framework for the agency to properly discharge its obligations to protect the water supply and to protect the Commonwealth's broader interests in open space protection under Article 97 of the Constitution of the Commonwealth. The intent of the Watershed Land Disposition Policy is to provide additional watershed-specific instructions to the Executive Office of Environmental Affairs on disposition of Article 97 lands.

Boundaries and Encroachments

It is important to sustain the marking of boundaries because of the fragmented pattern of BWM owned land in the Wachusett Reservoir watershed. The primary purpose of marking property boundaries is the avoidance of encroachment. Once an encroachment has been identified following field investigation, the Bureau will send a letter or letters to the offender to address the issue. Most resolutions end cordially and rarely has court action been required.

Forest Management

The primary goal of management of the Wachusett Reservoir watershed forest is the creation of a forest that best supports the production of high quality drinking water from the land. This watershed protection forest is vigorous, diverse in species and ages, actively accumulating biomass, and actively regenerating.

The first forest management plan for any BWM property, written in 1960 for the Quabbin Reservoir watershed forest, proposed that a predominantly uneven-aged forest provides the best protection for a high quality water supply. Every Quabbin plan since then has agreed with this statement including the latest 1995 – 2004 plan. The first Wachusett Plan continued this tradition with a conviction based on the most up-to-date information, the latest review of relevant information and literature, and the experience of the professional staff in the management of the Wachusett forest.


An uneven aged forest.

The conversion of the present even-aged forest to a forest comprised of at least three age classes has already begun, although at a slower pace than is now required, given the significant increase in acreage resulting from the land acquisition program. When the forestry program began in 1979, the BWM owned approximately 5,600 acres in the watershed compared to the 16,822 acres owned as of the writing of this plan. The creation of three well-defined age classes in any section of the forest necessitates that one-third of the forest be regenerated to a new age class followed by the creation of another age class some appropriate length of time later. This length of time will be about 20 to 30 years, a sufficient span of time to allow the various age classes to grow and thereby be well differentiated from each other. The principal goal for the next 30 years will be the establishment of a new age class on approximately one-third of the 12,000 acres of manageable forest on BWM land in the Wachusett Reservoir watershed

The silvicultural system that will be employed throughout the vast majority of the Wachusett forest in order to create three distinct age classes, is a variation of an uneven-aged system. The silvicultural method that perhaps best describes the regeneration plan for the Wachusett forest is group-selection or uneven-aged with patch cutting as suggested by Marquis (1991).

Over the next 30 years, one-third, or 4,000 acres, of the managed forest at Wachusett will be converted to a new age-class. For this age class to be evenly distributed throughout BWM land and evenly spaced through time, 130 acres must be regenerated each year. Therefore, approximately 400 acres will be treated annually (one-third of which is regenerated).

Green Certification

The BWM, in cooperation with EOEA and other state agencies, entered into a contract in 2002 to "Green Certify" all of BWM managed forests. Scientific Certification Systems (SCS), an independent organization, reviewed the agency's forest management practices on all BWM watersheds in 2002. This third party audit reviewed and critiqued the BWM's forest management practices with the ultimate goal of certifying BWM forests. Previous to this contract the MDC had accredited the Quabbin Reservoir watershed in 1997, making it the first public forest land accredited in North America. SCS has submitted their preliminary report which recommends certification for all BWM forests. This not only demonstrates the BWM's commitment to sound land management, but also provides the public consumer with an identified product that has been procured in a socially and environmentally responsible way.

Management of Non-Forested BWM Lands

In 1999, forestry and wildlife staff performed an intensive survey of all non-forested, non-wetland habitats on BWM land in the Wachusett Reservoir watershed. The following data were collected or calculated for each area:

- Habitat type (Forb dominated, Grass dominated, Shrub dominated, Hay field, Gravel pit, Administrative)
- Primary Cover (Forb, Grass, Shrub)
- Secondary Cover (Forb, Grass, Shrub)
- Primary Soil Class (Xeric, Mesic, Hydric)
- Secondary Soil Class (same)
- Slope (<1%, 1-5%, 6-10%, >10%)
- Aspect
- Invasives Present (Yes/No, including a list of species)
- Sub-Basin
- Acres
- General Comments (including the presence of birds that require non-forested habitats).

There are currently 162 uniquely identifiable non-forested management areas totaling 964 acres on BWM lands in the Wachusett Reservoir watershed (an additional 5 areas totaling 39.6 acres exist on off-watershed BWM lands). This represents about 6% of the total 16,384 acres of BWM land in the watershed. A management plan will be written for each field the Bureau intends to maintain as a field, which will address: the specific goal(s) of management, cutting/mowing schedules and procedures; control of invasive plants; filter strips width; and other maintenance practices.

The Bureau has been actively managing much of the shoreline around the Wachusett Reservoir. The shoreline is cut on a rotational basis and only tree species are removed. The goal is to encourage the herbaceous and shrub species to dominate the shoreline. This helps to limit leaf litter in the reservoir as well as protects the arborvitae along the shoreline from too much shading. Cutting woody vegetation along the shoreline will also help to discourage beavers from occupying these areas.

Management of New Acquisitions

As a result of the land acquisition program, DCR has many newly acquired parcels. For each new acquisition, bureau staff perform an initial assessment of the property, which includes the identification of any hazardous waste issues, evaluation of forest stands, and decisions regarding demolition or maintenance of any structures on the parcel.

Vernal Pool.

Management of Biodiversity

The Bureau's goals for biodiversity focus on either maintaining or enhancing natural ecosystems across the watershed. The Bureau recognizes that its greatest contribution to regional biodiversity is protecting large areas of land from development and maintaining most of those lands in forest cover.

Assessment

The majority of the Wachusett forest is over 70 years old, and originates from plantation establishment during the first half of the century and from natural regrowth. The 16,435 acres of BWM-owned forests and fields provide a significant level of long-term water quality protection to Wachusett Reservoir.

The successful Land Acquisition program has provided BWM with many new parcels, all of which require assessment, analysis, and management. This increase in land, however, has also limited the ability of existing staff to address the volume of routine maintenance on all Bureau property. Additional staff will help rectify this situation. In the meantime, a process has been initiated to ensure that land management work is prioritized based on water quality, emergency access and security issues.

Although most BWM-owned land in the Wachusett Reservoir watershed is forested, the number of non-forested BWM properties has also increased; there is an ongoing need for coordinated management of these fields, lawn and shoreline areas. The *2001-2010 MDC/DWM Wachusett Reservoir Watershed Land Management Plan* describes bureau staff activities on DCR lands in greater detail.

Control Approach

Goals

- To follow the land management guidelines that are outlined in the Wachusett Reservoir Watershed Land Management Plan.
- To continue to conduct all silvicultural activities and other management strategies with the ultimate goal of water quality protection.
- To assess all newly purchased lands and plan accordingly in order to manage them in the best way possible.

Objectives

- Create a vigorous, multi species, multi-layered forest that best supports the production of high quality drinking water from the land.
- Continue to enhance and maintain the ability of the watershed forest to both resist and recover from disturbance.
- Assess and implement immediate management needs on all newly acquired lands. Keep forest assessment updated following new acquisitions.
- Ensure through the use of strict CMPs that the maintenance of non-forested habitat has no negative impact on water quality.

Action Items

- Continue to conduct silviculture activities with the goal of forest diversity.
- Continue inspections to ensure compliance with BWM CMP forestry requirements for water quality protection.
- Continue to cut the reservoir shoreline on a rotational basis in order to encourage herbaceous and shrub species to dominate the shoreline.
- Write management plans for each parcel that the Bureau intends to maintain as a field.
- Identify and provide habitat for rare flora and fauna in order to promote biodiversity and eliminate, and prevent where possible, the spread of non-native invasive species.
- Continue to follow the objectives outlined in the Wachusett 10-year Land Management Plan, including approaches for newly acquired lands, forestry and management of fields and shoreline.
- Inspect BWM property bounds to identify encroachments.
- Conduct outreach with abutters of BWM lands to inform them of BWM property bounds and allowable uses of BWM lands.

4.3 Other Protected Lands

Accomplishments:
- Identified, characterized, and positively affected the protected lands owned by other parties, including the type of forest management and public access allowed on these lands.

Assessment:
In addition to the 20,600 acres owned or controlled through agreement by BWM, 9,590 acres are in protective ownership by EOEA agencies, towns, and private non-profit agencies. The Chapter 61 tax abatement program also provides a limited degree of protection to the 7,042 acres of enrolled privately owned lands.

Key Actions:
- Maintain inventory of protected lands.
- Continue the Conservation Restriction monitoring program.

Background

There are various protected open space lands within the Wachusett Reservoir watershed that are not managed by the BWM but still provide water quality protection. The owners of these properties include other state agencies, municipalities, nonprofit conservation organizations and private citizens.

Conservation Restrictions (CRs) on a private owner's property are an increasingly important form of land protection. CRs constitute a partial acquisition of rights to land ownership, usually in the form of development restrictions. The entity that purchases a CR agrees to acquire limited rights to property and to record these rights as an attachment to a landowner's deed. The landowner remains the owner and retains all rights to ownership except those described in the easement. This

agreement costs less than fee acquisition. CRs acquired by the Bureau for watershed protection must help insure the maintenance of a pure public water supply. It is the policy of the Bureau to expend funds for the purchase of conservation easements only on acreage with both present and projected uses that do not conflict with this water protection goal. Continued use of the CR property by its owners for forestry, wildlife, recreation, and privacy purposes is encouraged. Conservation easements do not require owners to make their land accessible to the public, but the Bureau annually monitors all CRs to inspect for continued compliance.

Another protection strategy for private land is the Chapter 61 program, which reduces property taxes for qualified forestry, agricultural and recreation lands. The Chapter 61 program protects against residential or commercial development. These lands are significant as a control on urbanization, but they may admit, under Chapter 61A, agricultural activities that can be a potential water quality concern (**see Section 6.4.2**). These lands, however, are not permanently protected; property can be removed from the program if the owner reimburses a town for the tax reductions plus a penalty surcharge. If a piece of Chapter 61 land is placed on the market for development, municipalities and the state have the first options to purchase the property. If no conservation minded buyer can be identified, then the owner has the right to build as otherwise allowed by local and state regulations.

Accomplishments:

All Conservation Restrictions that the Bureau now holds are field checked each year to maintain compliance. In 2002, the MDC and the city of Worcester successfully negotiated a conservation restriction agreement and MOU on approximately 2,800 acres of Worcester's water supply landholdings within the Wachusett Reservoir watershed. Legislation is being created to officially transfer the Conservation Restriction to the BWM.

Assessment

In addition to the 20,600 acres owned or controlled through agreement by BWM, 9,590 acres are in protective ownership by EOEA agencies, towns, private non-profits, and private landowners in the Chapter 61 program (**see Table 4-8**).

The Bureau's approach to maximize its land acquisition funds by purchasing Conservation Restrictions has made it a leading holder of these easements in the Commonwealth. While not providing as complete control as fee purchases, CRs are a significant resource protection strategy. The Bureau monitors each CR on an annual basis and works with the landowners to resolve any compliance issues with the language of the easement. The 2,003 acres held in CR are included in the figures of "BWM Controlled Land" presented in Section 2 and 4.1.

Approximately 7,000 acres are enrolled in the Chapter 61 program, which continues to be an integral element in the state's land conservation program. These enrolled properties, however, require continual observation because they can relatively easily be converted into residential or commercial uses. Towns, and then the BWM, have a "first right of refusal" to acquire a Chapter 61 property when it is placed on the market. Unfortunately, the time period for making this real estate transaction is usually much too short for either a municipality or the state to identify and commit the

necessary funds. Therefore, the BWM encourages owners who are considering the sale of their property to provide enough lead time for the agency to pursue, if warranted, an acquisition.

Table 4-8
Non-BWM Protected Lands in the Wachusett Reservoir Watershed

Agency	Acres	% of Watershed
DSPR[1]	2,213	3.2%
Other EOEA Agencies	1,926	2.7%
Municipalities	5,375	7.6%
Other Government/Nonprofit Organizations	2,289	3.2%
Total Permanent Protected Open Space	11,803	16.7%
Chapter 61	7,042	10%
TOTAL Other Protected Lands	18,846	26.7%

Source: DWSP GIS, 2003

[1] These lands are under a Care & Control MOU between DSPR and BWM. This figure is included in Section 2 and 4.1 as part of the acreage under BWM control.

Control Approach

Goals

- To maximize the water quality protection provided by non-BWM conservation land.
- To establish the Bureau's CR program as a model for other agencies programs.

Objectives

- Perform baseline surveys soon after a CR has been purchased.
- Monitor all CRs on a yearly basis and resolve any compliance issues.
- Continue work with other agencies and non-profit land organizations on implementing CMPs for watershed protection forests.

Action Items

- Perform baseline surveys on all CR purchases.
- Monitor all of the Bureaus CRs.
- Pursue care and control agreements with other state agencies and non-profit land protection organizations.
- Monitor Chapter 61 properties to encourage more permanent forms of protection.

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